

Detailed Course Outline

Unit 1 – Defining Agricultural Research and Development

Lesson 1.1 Agricultural Advances

1. Research and development of new ideas and innovations are used to solve problems, provide goods, and increase productivity in agriculture.
2. Documentation of plans and processes is used by researchers in the development of new ideas and products.
3. Solving complex, real-world problems includes defining the problem, proposing a solution, developing a protocol, collecting and analyzing data, and communicating results.

Lesson 1.2 Project Management

1. Efficient project management is based on an awareness of personal strengths.
2. Project management requires planning, scheduling, self-motivation, and prioritization skills.

Unit 2 – Problems and Solutions

Lesson 2.1 Defining the Problem

1. Agricultural researchers are faced with a multitude of local, national, and global issues.
2. Brainstorming is a technique used to define and refine topics and problem statements.
3. Practical considerations, such as time, motivation, materials, and support, are constraints when selecting a problem to solve.
4. Writing a well-defined and accurate problem statement guides research and helps determine if the solution has solved the problem.

Lesson 2.2 Proposing Solutions

1. Finding solutions to a problem are impacted by social, legal, financial, and environmental considerations.
2. A feasibility study may be used to determine the viability of new ideas and innovations.
3. A proposed solution must be written to be testable or solvable.
4. Partnering with professionals in the field can validate and guide research when solving a problem.

Unit 3 – Methodology

Lesson 3.1 Planning Ahead

1. Carefully planned step-by-step instructions guide the problem solving process.
2. Project scope is determined by the resources available.
3. Researchers use a literature review to curate a collection of information on a topic.

Lesson 3.2 Data Collection

1. The problem dictates the type of data needed for valid results.
2. Selection of appropriate data collection instruments is necessary for valid data.
3. Standards are necessary when collecting data.
4. An ongoing evaluation process monitors the validity of the solution.

Unit 4 – Reporting Data

Lesson 4.1 Results and Conclusions

1. Researchers use graphs and charts to interpret, analyze, and organize data.
2. Researchers collect and analyze data to solve a problem.
3. Conclusions of research are derived from data.
4. Project reflection encourages expansion and continuation.

Unit 5 – Communication

Lesson 5.1 Communicating Results

1. Communicating results to a target audience disseminates the body of research for further use.
2. Sharing a professional body of work promotes ongoing research.
3. Researchers use various media to communicate results professionally.

Lesson 5.2 Going Forward

1. Society is impacted by new solutions to problems.
2. A portfolio of work communicates all aspects of research.